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ABSTRACT

Work-Based Learning (WBL) has been at the heart of school-to-work initiatives in the 1990s. Local partnerships funded by the 1994 School-to-Work Opportunities Act are placing high priority on developing WBL opportunities for students. However, there is still controversy about whether work really contributes to students' education, and results of research has been mixed. Students seem to reap economic rewards, but they sometimes pay an educational price. Connecting students' work to classroom learning could mitigate this tradeoff, though it is difficult to do. Expected benefits of work experience, which have been substantiated in some cases, include the following: (1) acquisition of knowledge or skill related to employment in particular occupations or industries; (2) career exploration and planning; (3) learning all aspects of an industry; (4) increasing personal and social competence related to work in general; and (5) enhancing students' motivation and academic achievement. It is necessary to look for more definitive evidence for these benefits, however, and to involve academic teachers if WBL is to be successful. If this can be done, WBL can offer a promising approach for preparing students for work and for life. (Contains 41 references) (KC)

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THE CONTINUING PROMISE OF WORK-BASED LEARNING

Work-based learning (WBL) has been at the heart of school-to-work initiatives in the 1990s. Local partnerships funded by the 1994 School-to-Work Opportunities Act are placing high priority on developing WBL opportunities for students (Hershey et al., 1997). But does work really contribute to students' education? Past experience has yielded mixed results: students who work seem to reap economic rewards, yet they sometimes pay an educational price. Connecting students' work with classroom learning could mitigate this tradeoff, though it is difficult to do. To increase the likelihood of achieving the benefits that advocates of WBL now propose, we should take heed of the research and experience that have accumulated over the past 25 years.

Avenue to Adulthood or Detour to Degeneracy?

The 1990s WBL initiatives are reminiscent of the work experience movement of the 1970s, when the President's Science Advisory Committee (1973), headed by James Coleman, articulated the view of many experts that giving young people productive responsibilities outside of school would help them make the transition to adulthood. Children born in the 1950s shouldered less responsibility for helping to support their families than any previous generation in history. As these children came of age, experts worried about their psychosocial development and prescribed moderate doses of work experience. In response, nearly two out of three high schools in 1977 were giving academic credit for students working off-campus (Abramowitz & Tenenbaum, 1978).

Despite the apparent consensus that work experience was good for teenagers, some critics challenged this assumption. Most notably, a series of studies by Greenberger and Steinberg investigated working high school students in Orange County, California and concluded that work experience "may make them economically rich, but may also make them psychologically poor" (1986, p. 238). The researchers found that working teenagers spent most of their pay on luxury consumption for themselves. Teenage workers were more likely than nonworkers to drink alcohol and smoke marijuana, and boys who worked were also more likely to gamble. Teenagers who spent more time working were more likely to express a cynical attitude toward work. A large proportion of the working students in the Orange County sample admitted to illegal or immoral conduct, such as stealing merchandise or calling in sick when they were not ill. These results commanded widespread attention and began a more serious debate about the supposed benefits of work experience.

Work Pays, but Quality Matters

The economic payoff from working while in high school is well established. In addition to immediate earnings, research has consistently found a positive association between amount of high school work experience and employment or earnings a few years later. This research was reviewed by Stern et al. (1995).

Some studies have also indicated that jobs that provide greater opportunity for students to use and develop their skills have more positive effects. Analyzing data on dozens of qualitative characteristics of students' jobs, Stern and Nakata (1989) found opportunity for skill use and development was the only qualitative factor that significantly predicted subsequent employment and wages in 1980-82. Mortimer et al. (1992), studying a sample of 1000 randomly chosen ninth graders from St. Paul who were followed to grade twelve, examined the relationship between work experience and the development of occupational values. They found no significant effects of hours worked or employment itself on these values. The opportunity to acquire skills at work, however, had a substantial positive effect on development of intrinsic orientation toward work; that is, interest in rewards embedded in the work activity itself. Similarly, Stern et al. (1990a) found in cross-sectional data that students who report greater opportunities for learning on the job also express a more positive orientation toward work in general.

Selection bias has not been controlled in these studies. Students who work, who spend more time working, or who work at better jobs while in high school may also possess unobserved traits that lead to more favorable employment outcomes later. However, Ruhm (1995) found that work experience during senior year had a positive effect on subsequent employment and earnings, while work experience during sophomore and junior years did not. This suggests that it is the senior-year work experience itself, rather than the student's predisposition to work, which accounts for the subsequent positive results in the labor market.

Working Long Hours May Detract from Students' Performance in School

Although students who work while in high school enjoy greater subsequent success in the labor market, some research has also found that their educational achievement suffers, at least if they work too many hours a week. Stern et al. (1995) summarized the research up to 1993. Ten studies found that students who worked

long hours—usually more than 15 or 20 hours a week—had lower grades, did less homework, were more likely to drop out, or were less likely to complete postsecondary education. Three studies that examined high school students working long hours found no significant effects. The preponderance of evidence up to 1993 therefore indicates that students who work more than 15 or 20 hours a week while in high school perform less well academically. A more recent study by Carr, Wright, and Brody (1996) also finds a negative association between hours worked while in high school and subsequent educational attainment, though they emphasize that the net economic effect of working while in high school is still positive nine to twelve years after high school graduation, even allowing for the fact that students who work more in high school are less likely to go to college.

What about students who are employed while in high school, but less than 15 or 20 hours per week? The 1995 review by Stern et al. found five studies that reported students working a moderate number of hours per week had *better* grades, test scores, or likelihood of going to college than students who did not work at all. On the other hand, three studies found that students who worked moderate hours did worse in school than students who did not work at all. It is difficult to conclude from these findings whether a moderate amount of work while in high school helps or hurts students' academic performance compared to not working at all, but it does seem clear that students who work less than 15 or 20 hours do better than those who work more.

The association between working and school performance does not necessarily show cause and effect. Students who work long hours may simply be more interested in work than in school. Attempts to control statistically for this kind of possible selection bias have yielded mixed results (Stern et al., 1995).

School Supervision Helps

These results pertain to students who work in jobs that are not connected with school. Most students' jobs, in fact, have no connection with school. But work-based learning, as promoted by current school-to-work initiatives, is supposed to be linked to classroom learning. What difference does it make if school and work are connected?

A longitudinal study sponsored by the National Center for Research in Vocational Education (NCRVE) was designed to answer this question, among others. The study, which began in 1988 and continued into 1992, collected data from about two thousand high school students and a thousand students in community colleges. Some students at each site were working in jobs not connected with school, and some were not working at all. The rest were enrolled in cooperative education (co-op), a traditional form of school-supervised work experience that is still the most prevalent kind of planned work-based learning for U.S. high school students (see Barton, 1996). Stone et al. (1990) found in the high school sample that co-op students had consistently more positive perceptions of their jobs, and of the relationship between work and school, than students did in non-co-op jobs. Stern et al. (1992) reported parallel results for the community college sample. Stern et al. (1997) found that the negative association between working long hours and grades was less strong among high school co-op students than among students in non-co-op jobs. These results, which are consistent with previous research summarized by Stern et al. (1990b), indicate that school supervision of students' work experience may increase its educational value.

Stern et al. (1997) also tested the effects of participation on subsequent performance in the labor market. In the high school sample, former co-op students earned significantly higher wages than other students one to three years after graduation. They were also significantly less likely to attend college, however, and when this is taken into account the association between co-op participation and wages becomes statistically insignificant. These results are attributable to the fact that the high school co-op students in this sample were participating in vocational education programs designed primarily to prepare them for work rather than college. Work-based learning might have different effects if it is part of a school-to-work program that prepares students for both work and further education, but this has not yet been tested.

Promises, Promises

Research and experience from the past 20 years have revealed some of the pitfalls of work experience for students. We can no longer simply assume that all work experience is good. We must ask what it is good *for*. A scan of current literature suggests several possible purposes:

- Acquisition of knowledge or skill related to employment in particular occupations or industries.
- Career exploration and planning.
- Learning all aspects of an industry.
- Increasing personal and social competence related to work in general.
- Enhancing students' motivation and academic achievement.

These purposes are not mutually exclusive. To some extent they may even be mutually reinforcing. For example, learning all aspects of an industry may promote career awareness and planning. Given that students have limited time, however, it is not possible to maximize all of these.

purposes simultaneously. Therefore, in practice, different programs emphasize different purposes. (The following discussion is taken from Urquiola et al. [1997], which also provides numerous examples.)

Acquisition of knowledge or skill related to employment in particular occupations or industries. This is the main purpose of traditional apprenticeship, co-op, and other forms of on-the-job training. Learning by doing, under the guidance of an experienced supervisor, is intended to develop knowledge and facility with specific equipment and procedures that are necessary to do the job.

In the 1990s, however, this traditional practice is being placed in a lifetime career perspective. Preparation that is limited to a particular entry-level job is increasingly regarded as insufficient, because the job is likely to change soon. New skill standards for various industries and occupational clusters therefore include "core competencies" or "foundations" that should enable people to progress and adapt as conditions change (Klein, 1996; Tucker, 1995). Hamilton and Hamilton (1997), in proposing "technical competence" as the first of seven "principles for work-based learning," explain it this way:

> Work-based learning teaches young people how to perform work tasks. ... Technical competence includes not only mastering procedures but also understanding fundamental principles and concepts underlying procedures, increasing capacity for analytical judgment, and, in most occupational areas, becoming computer literate (p. 10).

Career exploration and planning. The school-to-work movement of the 1990s arose in part from concern that young people in the United States often spend several years "floundering" in the labor market before they find steady, long-term jobs (Hamilton, 1990). Although some amount of job search and exploration is necessary and beneficial, bouncing aimlessly from one unrelated job to another, with periods of unemployment in between, can be frustrating and wasteful. If a young person's journey through school and early work experiences could be more connected and purposive, the chances of eventually finding enjoyable and rewarding work might be better. The idea of "career majors" in the 1994 School-to-Work Opportunities Act is intended as a structure for students to create a coherent sequence of learning and work experiences. In this context, work-based learning allows students to sample different kinds of work, to understand what is going on and how they might fit in, but without necessarily making any long-term commitment. Many local programs are now sequencing WBL for high school students to start with brief job shadowing visits, and lead to longer experiences later (Pauly, Kopp, & Haimson, 1995; Hershey et al., 1997). At the post-secondary level, an elaborate structure for work-based career exploration and planning has developed at LaGuardia Community College in New York City (Grubb & Badway, 1995).

Learning all aspects of an industry. This is an explicit objective in both the 1990 Perkins Amendments and the 1994 School-to-Work Opportunities Act. This stipulation was intended to ensure that vocational education or school-to-work programs teach more than the skills needed for specific entry-level jobs. According to the Center for Law and Education, a chief proponent of the concept, providing students with understanding and experience in all aspects of an industry or industry sector is essential to integrating academic and vocational education, empowering students to make career choices, preparing them to adapt to technological change, and equipping them to play an active part in economic development of their local communities (Jacobs, 1995). Hamilton and Hamilton (1997) add that broader knowledge and skill enable students to participate in flexible work teams, which are becoming more prevalent in many settings.

The 1994 law, with only minor changes from 1990, specifies eight aspects: planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and issues related to health, safety, and the environment (Jacobs, 1995).

School-based enterprises offer some advantages as work settings in which students can learn about all aspects of an industry. Because their main purpose is educational, school enterprises can give students more room to experiment and make mistakes than a non-school enterprise usually can do. Students working both in school enterprises and in outside jobs have reported that school enterprises provide more opportunities for learning, doing a range of tasks, and working in teams (Stern, 1984; Stern et al., 1994). Numerous testimonial statements from students in high school and community college enterprises were reported in Stern et al. (1994), including descriptions of how some school enterprises even engage students in designing or redesigning job structures and organizational procedures. Bragg and Hamm (1996) give recent examples of college-sponsored enterprises, including a fruit tree orchard and a child care center, where students can learn many aspects of their chosen field.

Increasing personal and social competence related to work in general. Beyond technical skills, career awareness, and learning all aspects of an industry, many contemporary discussions of WBL also point to a broader set of capacities

that are assumed to be desirable in most or all work situations, not only in particular occupations or industries. Sometimes termed generic work skills, core competencies, or transferable skills, they encompass two basic dimensions that Hamilton and Hamilton (1997) call personal and social competence.

Making up lists of these generic capacities has become a popular activity in the 1990s, and many public and private groups of employers or educators have produced frameworks (see Klein, 1996). The one that has had the most influence in the United States so far was the SCANS report (U.S. Department of Labor, 1991). The Secretary's Commission on Achieving Necessary Skills, appointed by the Secretary of Labor, proposed a way for schools to conceive of knowledge and skill beyond the traditional academic disciplines. The SCANS framework consists of a three-part foundation, then five general competencies. The three-part foundation includes basic skills, thinking skills, and personal qualities. Over and above this foundation, SCANS sketched competencies along the five dimensions of resources, interpersonal relations, use of information, understanding systems, and employing technology.

A more parsimonious list was proposed by Murnane and Levy (1996), based on their observation of hiring practices by employers who screen new applicants carefully for jobs that do not require college degrees. Their list includes ninth grade reading and math, solving semi-structured problems, working in groups, oral and written communication, and the ability to use computers. "These are the New Basic Skills, the minimum skills people now need to get a middle-class job" (pp. 31-32).

One fundamental question is whether WBL is intended merely to adapt young people to jobs, or whether it is also intended to develop their capacity for creative and critical thinking about work (Simon, Dippo, & Schenke, 1991). Obviously, an employer's interest sometimes conflicts with the interests of employees. The basic fact that employees' pay and benefits are costs to employers is a perpetual cause of conflict, though it may not be overt. Health and safety, the division of work responsibilities, and lack of participation in decision making are other sources of conflict between employers and employees. One way or another, WBL designers and teachers have to deal with these contentious issues. Confronting them openly might help students better understand their options.

Enhancing students' motivation and academic achievement. Farthest removed from WBL's traditional goal of teaching skills and knowledge related to particular occupations is the objective of improving students' academic performance in school. It may even seem too great a stretch: Why should experience on a job be expected to improve achievement in the classroom? The answer has a negative and a positive part. First, students' work experience might be redesigned so that working long hours does less damage to achievement in school. As we have noted, numerous studies find that students who work more than a certain number of hours per week tend to perform less well in school. If students' work experience were more closely connected with school, it might do less harm to academic motivation and performance. Stern et al. (1997) present evidence that the negative relationship between grades and hours worked per week is in fact weaker for high school co-op students than for students working in non-co-op jobs.

Second, research in the 1980s on learning outside of school stimulated new interest in the idea that providing some kind of "contextual" or "situated" learning opportunities for students would improve their understanding and retention of academic subject matter (Resnick, 1987; Raizen, 1989; Lave & Wenger, 1991). Many educational authorities in the past, notably Dewey (1916) and Whitehead (1929/1949), have argued that education should confront students with problems that matter to them, including practical problems that arise in the context of productive activity. In the United States, however, debates have tended to oscillate between the ideological poles of "relevance" and "rigor." The advocates of work experience in the 1970s, for example, were tilting far toward relevance, and the "excellence" movement of the early 1980s was in part a reaction against that. Cognitive scientists in the late 1980s and 1990s offered the possibility that "applied learning" or "cognitive apprenticeship" might achieve rigor *through* relevance. And there is evidence that engaging students in activities that have value beyond the classroom contributes to academic achievement even as measured by conventional tests (Newmann & Wehlage, 1995). This research has prompted educators to take another look at WBL as a possible means to improve academic performance.

Hamilton and Hamilton (1997) list "academic achievement" as one of their seven principles for work-based learning. Their demonstration project revealed, however, that WBL by itself was not sufficient to raise students' academic achievement.

> We conclude that neither grades nor course enrollments will improve as an indirect result of work-based learning; improved academic performance must be a central focus of school-to-work systems and specific steps taken to foster it. The most critical need is for a variety of learning options and instructional approaches, for explicit links between knowledge and applica-

tion, and for new school structures (p. 54).

Bringing out the academic content of students' work experience is mainly the responsibility of the school or college, though worksite supervisors must collaborate and support the effort. To the extent that WBL is intended to promote students' academic achievement rather than teach specific job skills, enterprises sponsored by schools and colleges themselves become more advantageous. Stern et al. (1994) describe a number of such enterprises. In a recent study, Stasz and Kaganoff (1997) analyzed the learning conditions in several high school work experience programs. They found that a school-based enterprise (SBE) stood out as an approach that

> ... strongly supported academics. By joining the SBE, students could be tutored in any subject, receive preparation SAT and ACT testing, and get personal assistance to apply to college. Doing well in school and raising academic aspirations were as important as running the business.... The SBE clearly enhanced school learning and overall academic achievement (p. 73).

As the WBL revival of the 1990s has gained momentum, there is still controversy about whether it can benefit students who are already performing well in school, or whether it should mainly be reserved for the "non-college-bound." Few would object if students who were performing poorly in school became encouraged by work experience and a related curriculum to continue their studies after high school. But there is definitely opposition to the idea of adding WBL to the college-prep curriculum (Bailey and Merritt, 1997; Vo, 1997). As a result, students in career-related programs featuring WBL sometimes feel they are being stigmatized as less academically able (Pauly, Kopp, & Haimson, 1995).

Hard Eggs to Crack

Does WBL in fact accomplish any or all of these purposes? The evidence is encouraging, but incomplete. Based on direct observation of students in three WBL programs, as well as interviews and questionnaires, Stasz and Kaganoff (1997) found positive indications of learning in all the categories mentioned above. Interviews by Olson (1997) in a number of locations around the country also yielded enthusiastic reports from students and employers about the benefits of WBL. Additional testimony from other programs is excerpted by Urquiola et al. (1997).

All of these studies, however, rely on reports by participants themselves about what they are learning. Objective measures, and comparisons with non-participants, are lacking. We cannot tell whether the positive reports indicate a true effect of WBL, as opposed to the effect of recruiting participants who are enthusiastic about WBL to begin with, or the Hawthorne effect of participating in something innovative that attracts attention.

It is important to look for more definitive evidence because the challenges to making high-quality WBL available to large numbers of students are formidable. The first report on the evaluation of school-to-work partnerships funded through the states found that the great majority of work placements were obtained by students themselves, not by the school. Although it is possible to convert students' part-time jobs into powerful learning experiences, students' responses suggested that this was not usually happening. Links between students' work experience and the classroom was infrequent and generally tenuous. Only 16 percent of the seniors responding to the survey indicated that they had completed a classroom assignment using information or skills gained from an intensive work-based activity, and had their performance in that activity count toward a grade at school (Hershey et al., 1997).

If WBL is intended not only to expose students to the workplace and give them an opportunity to acquire specific procedural know-how, but also to accomplish any of the broader purposes described here, then it must be carefully planned and monitored by people who understand both the work setting and what is to be learned there. Steinberg (1997) spells out "six A's": authenticity, adult connections, academic rigor, applied learning, active exploration, and assessment. These criteria echo and elaborate on the definition of authentic pedagogy developed by Newmann and Wehlage (1995).

To ensure that WBL becomes an integral part of the curriculum, teachers of academic subjects have to be involved. Traditionally, cooperative education has linked structured work experience with instruction in vocational subjects, and has been supervised by vocational teachers. If WBL is to serve broader educational purposes and a broader cross-section of students, it will have to be linked to instruction in the core academic subjects of English, math, science, foreign language, and social studies. This is possible, as Vickers (1996) has demonstrated with science curriculum, but it will not happen on a large scale unless and until academic teachers are persuaded that it is worthwhile for themselves and their students. Resistance may be strongest on the part of teachers in college-prep courses. Whether WBL helps students prepare for the Advanced Placement examination in calculus or history, for example, still remains to be seen. Sending non-vocational teachers to spend some time in workplaces outside the school may help them find practical applications of their subject matter, and school-to-work partnerships therefore

have been providing this kind of opportunity through summer internships and other arrangements.

There may be a chicken-and-egg problem here, however. Teachers who do not believe that work experience has anything to offer their students may be unwilling to spend the time looking at workplaces themselves. If they believe that good instruction in academic subjects builds general intellectual skills which are useful in work settings—which is probably true—they may also believe that school-supervised work experience for students has little to add and is not worth the trouble. Cracking this resistance will require evidence showing how WBL can augment classroom instruction as preparation both for work and for life. Recent evidence is promising.

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References

Abramowitz, S. & Tenenbaum, E. (1978). *High school '77, a survey of public secondary school principals.* Washington, DC: National Institute of Education.

Bailey, T. & Merritt, D. (1997). *School-to-work for the college bound* (MDS-799). Berkeley, CA: National Center for Research in Vocational Education, University of California at Berkeley.

Barton, P.E. (1996). *Cooperative education in high school: Promise and neglect.* Princeton, NJ: Policy Information Center, Educational Testing Service.

Bragg, D.D. & Hamm, R.E. (1996). *Linking college and work: Exemplary policies and practices of two-year college work-based learning programs* (MDS-795). Berkeley, CA: National Center for Research in Vocational Education, University of California at Berkeley.

Carr, R.V., Wright, J.D., & Brody, C.J. (1996). Effects of high school work experience a decade later: Evidence from the National Longitudinal Survey. *Sociology of Education*, 69, 66-81.

Dewey, J. (1916). *Democracy and education: an introduction to the philosophy of education.* New York, NY: Macmillan.

Greenberger, E. & Steinberg, L.D. (1986). *When teenagers work.* New York: Basic Books.

Grubb, W.N. & Badway, N. (1995). *Linking school-based and work-based learning: The implications of LaGuardia's co-op seminars for school-to-work programs.* Paper prepared for the U.S. Congress, Office of Technology Assessment. Berkeley, CA: School of Education, University of California.

Hamilton, M.A. & Hamilton, S.F. (1997). *Learning well at work: Choices for quality.* Ithaca, NY: Cornell Youth and Work Program, Cornell University.

Hamilton, S.F. (1990). *Apprenticeship for adulthood.* New York: The Free Press.

Hershey, A.M., Hudis, P., Silverberg, M., & Haimson, J. (1997). *Partners in progress: Early steps in creating school-to-work systems.* MPR 8292-650. Princeton, NJ: Mathematica Policy Research, Inc.

Jacobs, L. (1995). *The School-to-Work Opportunities Act of 1994: A guide to the law and how to use it.* Washington, DC: Center for Law and Education.

Klein, S.G. (1996). *Skill standards: Concepts and practices in state and local education. A synthesis of literature and alternative conceptual frameworks.* Berkeley, CA: MPR Associates.

Lave J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge University Press, Cambridge, UK.

Mortimer, J.T., Ryu, S., Dennehy, K., & Lee, C. (1992). *Part-time work and occupational value formation in adolescence.* Paper presented at the annual meeting of the American Sociological Association.

Murnane, R.J. & Levy, F. (1996). *Teaching the new basic skills.* New York: The Free Press.

Newmann, F.C. & Wehlage, G.G. (1995). *Successful school restructuring.* Madison, Wisconsin: Center on Organization and Restructuring of Schools, University of Wisconsin.

Olson, L. (1997). *The school-to-work revolution.* Reading, MA: Addison-Wesley.

Pauly, E., Kopp, H., & Haimson, J. (1995). *Home-grown lessons: Innovative programs linking school and work.* San Francisco: Jossey-Bass.

President's Science Advisory Committee. (1973). *Youth: Transition to adulthood.* Washington, DC: U.S. Government Printing Office.

Raizen, Senta A. (1989). *Reforming education for work: A cognitive science*

perspective (MDS-024). Berkeley, CA: National Center for Research in Vocational Education, University of California at Berkeley.

Resnick, L.B. (1987). Learning in school and out. *Educational Researcher*, 16, 13-20.

Ruhm, C.J. (1995). *Is high school employment consumption or investment?* Working paper No. 5030. Cambridge, MA: National Bureau of Economic Research.

Simon, R.I., Dippo, D., & Schenke, A. (1991). *Learning work: A critical pedagogy of work education.* New York: Bergin & Garvey.

Stasz, C., & Kaganoff, T. (1997). *Learning how to learn at work: Lessons from three high school programs.* Unreviewed draft. DRU-1697-NCRVE/UCB. Santa Monica, CA: RAND.

Steinberg, A. (1997). *Real learning, real work: School-to-work as high school reform.* London: Routledge.

Stern, D. (1984, June). School-based enterprise and the quality of work experience: A study of high school students. *Youth & Society*, 15(4), 401-427.

Stern, D., Finkelstein, N., Stone, J.R. III, Latting, J., & Dornsife, C. (1995). *School to Work: Research on Programs in the United States.* Washington and London: Taylor and Francis, Falmer Press.

Stern, D., Finkelstein, N., Urquiola, M., & Cagampang, H. (1997). What difference does it make if school and work are connected? Evidence on cooperative education in the United States. *Economics of Education Review, 16*(3), 213-229.

Stern, D., McMillion, M., Hopkins, C., & Stone, J.R. III. (1990b). Work experience for students in high school and college. *Youth & Society, 21*(3), 355-389.

Stern, D. & Nakata, Y. (1989). Characteristics of high school students' paid jobs, and employment experience after graduation. In Stern, D. & Eichorn, D. (Eds.): *Adolescence and work: Influences of social structure, labor markets, and culture.* Hillsdale, NJ: Erlbaum.

Stern, D., Stone, J.R. III, Hopkins, C., & McMillion, M. (1990a). Quality of students' work experience and orientation toward work. *Youth & Society, 22*(2), 263-282.

Stern, D., Stone, J.R. III, Hopkins, C., McMillion, M. & Cagampang, H. (1992). Quality of work experience as perceived by two-year college students in co-op and non-co-op jobs. *Journal of Cooperative Education, 28*(1), 34-47.

Stern, D., Stone, J.R. III, Hopkins, C., McMillion, M., & Crain, R. (1994). *School-based enterprise: Productive learning in American high schools.* San Francisco, CA: Jossey-Bass.

Stone, J.R. III, Stern, D., Hopkins, C., & McMillion, M. (1990). Adolescents' perception of their work: School supervised and non-school-supervised. *Journal of Vocational Education Research, 15*(2), 31-53.

Tucker, M. (1995). *On occupational clusters: Early thoughts on organizing the work of the National Skill Standards Board.* Washington, DC: National Center on Education and the Economy.

Urquiola, M., Stern, D., Horn, I., Dornsife, C., Chi, B., Williams, L., Merritt, D., Hughes, K., & Bailey, T. (1997, forthcoming). *School to work, college and career.* Berkeley, CA: National Center for Research in Vocational Education, University of California.

U.S. Department of Labor, Secretary's Commission on Achieving Necessary Skills (SCANS). (1991). *What work requires of schools.* Washington, DC: U.S. Department of Labor.

Vickers, M. (1996). *Working to learn.* Cambridge, MA: TERC.

Vo, C.D., (1997). "Not for *my* child." *Techniques, 71*(9), 20-23.

Whitehead, A.N. (1929). *The aims of education.* New York: MacMillan. Mentor Books edition, 1949.

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